

§1
cont'd
a chain of ribonucleotide or deoxyribonucleotide units or of analogous units of nucleotides modified on the sugar or on the base and bonded to one another via natural phosphodiester internucleotide bonds, some of the internucleotide bonds optionally being replaced with phosphonate, phosphoramidate or phosphorothioate bonds.

4. (Amended) The process as claimed in claim 1, wherein the oligonucleotide consists of a chain comprising both ribonucleotide or deoxyribonucleotide units bonded to one another via phosphodiester bonds and analogous units of nucleosides bonded to one another via amide bonds.

§2
5. (Twice Amended) The process as claimed in claim 1, wherein the oligonucleotide consists of ribonucleotide or deoxyribonucleotide units, one of which may comprise a functional group of NH₂, COOH, CHO, OH, SH, halide, sulfonate, epoxide, or maleimide, introduced onto or generated on said unit, or the functional group introduced using a spacer arm bonded to the terminal phosphate group in the 3' or 5' position.

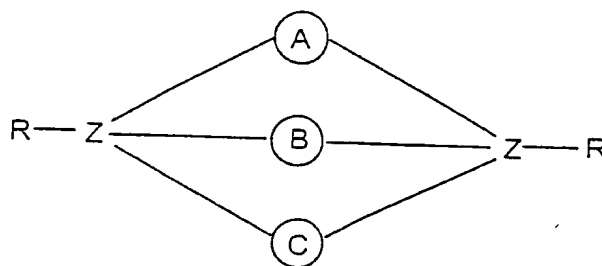
§3
6. (Amended) The process as claimed in claim 5, wherein said unit is the 5' terminal unit or 3' terminal unit.

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7. (Twice Amended) The process as claimed in claim 1, wherein the oligonucleotide comprises a chain of 5 to 50 nucleotides or a chain of 5 to 50 nucleotides and nucleotide or nucleoside analogs.

8. (Twice Amended) The process as claimed in claim 1, wherein the oligonucleotide consists of a chain of ribonucleotide or deoxyribonucleotide units bonded to one another via phosphodiester bonds and of analogous units of nucleosides bonded to one another via amide bonds, said oligonucleotide comprising at least 5 phosphodiester internucleotide bonds at the end intended to be bonded to the cryptate.

9. (Twice Amended) The process as claimed in claim 1, wherein the rare-earth metal cryptate is bonded covalently to the oligonucleotide either directly or via a spacer arm.

10. (Twice Amended) The process as claimed in claim 1, wherein said rare-earth metal cryptate consists of at least one rare-earth metal salt complexed with a macropolycyclic compound of formula



in which Z is an atom with 3 or 4 valencies, R is nothing or represents hydrogen, a hydroxy group, an amino group or a hydrocarbon-based radical, the divalent radicals (A), (B) and (C) are, independently of each other, hydrocarbon-based chains which optionally contain one or more hetero atoms and are optionally interrupted with a hetero macrocycle, at least one of the radicals (A), (B) and (C), also comprising at least one molecular unit or consisting essentially of a molecular unit, said molecular unit having a triplet energy which is greater than that of the emission level of the complexed rare-earth metal ion.

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11. (Amended) The process as claimed in claim 10, wherein the rare-earth metal cryptate consists of a rare-earth metal salt complexed with one of the macrocyclic or macropolycyclic compounds below:

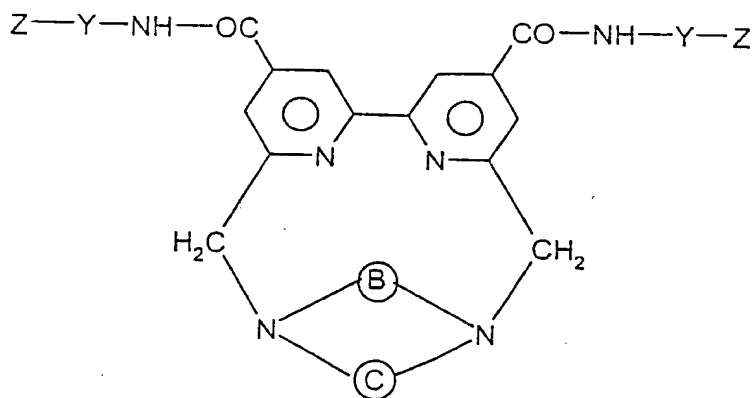
[2.2.phenanthroline]; [2.2.phenanthroline amide]; [2.2.anthracene]; [2.2.anthracene amide]; [2.2.biisoquinoline]; [2.2.biphenyl-bis-pyridine]; [2.2.bipyridine]; [2.2.bipyridine amide]; the macropolycycles trisbipyridine, trisphenanthroline, phenanthrolinebisbipyridine, biisoquinolinebisbipyridine, bisbipyridine diphenylbipyridine; a macropolycyclic compound

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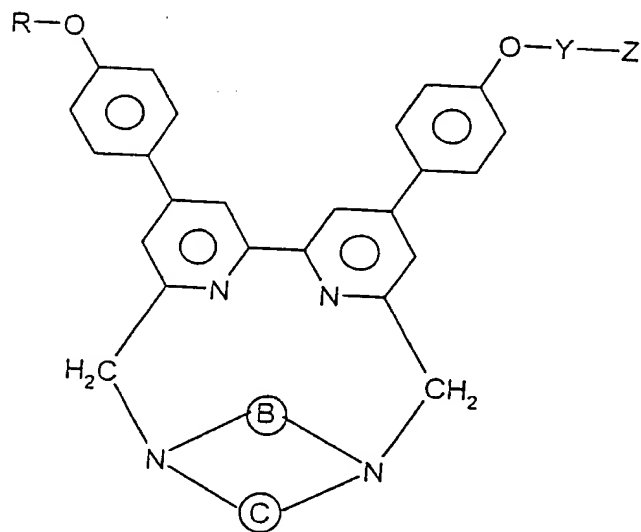
comprising a molecular unit chosen from bipyrazines, bipyrimidines and nitrogen-containing heterocycles comprising N-oxide groups.

12. (Twice Amended) The process according to claim I, wherein the rare-earth metal cryptate consists of at least one rare-earth metal salt complexed with a macropolycyclic compound corresponding to one of the formulae II or III below:

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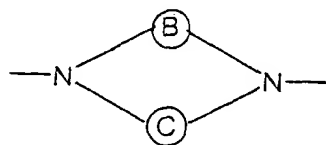
II



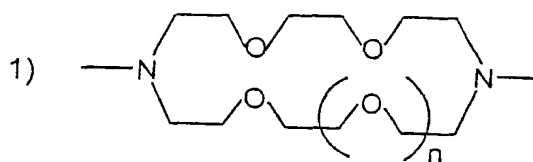
III

in which:

- the ring of formula



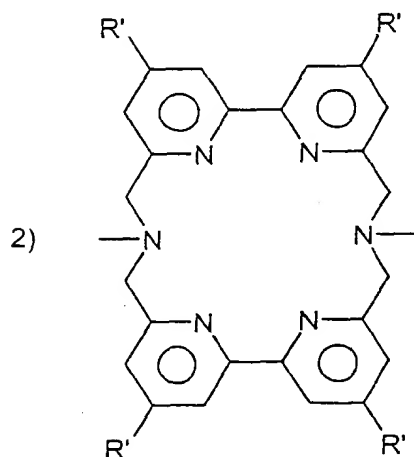
is one of the following rings:



$n = 0$ or 1

$[N_2O_4]$ macrocycle or cycle (22)

$[N_2O_3]$ macrocycle or cycle (21)



bisbipyridine macrocycle

-Y is a spacer group or spacer arm which consists of a divalent organic radical, chosen from linear or branched C_1 or C_{20} alkylene groups optionally containing one or more double bonds and/or optionally containing one or more hetero atoms such as oxygen, nitrogen, sulfur or phosphorus or one or more carbamoyl or carboxamido group(s); chosen from C_5 to C_8 cycloalkylene groups or chosen from C_6 to C_{14} arylene groups, said alkylene, cycloalkylene or

arylene groups being optionally substituted with alkyl, aryl or sulfonate groups;

-Z is a functional group capable of bonding covalently to a biological substance;

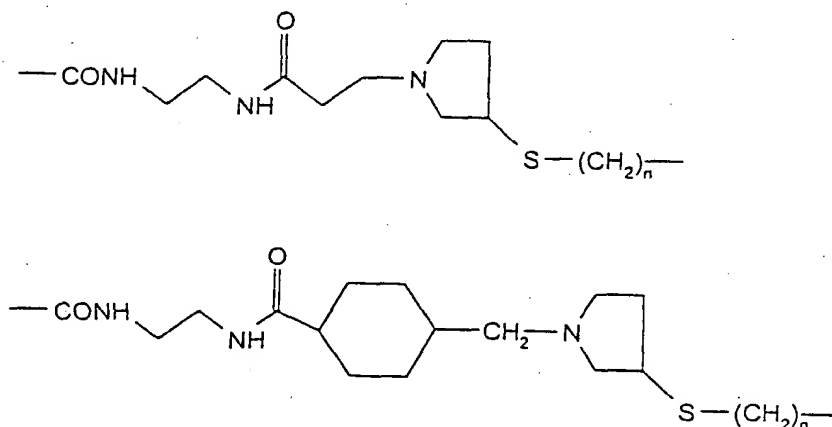
-R is a methyl group or represents the group -Y-Z;

-R' is hydrogen or a group -COOR'' in which R'' is a C₁ to C₁₀ alkyl group and preferably represents a methyl, ethyl or tert-butyl group, or alternatively R' is a group -CO-NH-Y-Z.

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amend

13. (Twice Amended) The process as claimed in claim 1, wherein the rare-earth metal cryptate is bonded to the oligonucleotide via a spacer arm consisting of a divalent organic radical chosen from C₁-C₂₀ linear or branched alkylene groups optionally containing one or more double bonds or triple bonds and/or optionally containing one or more hetero atoms, such as oxygen, nitrogen, sulfur, phosphorus or one or more cabamoyl or carboxamino group(s); C₅-C₈ cycloalkylene groups and C₆-C₁₄ arylene groups, said alkylene, cycloalkylene or arylene groups being optionally substituted with alkyl, aryl or sulfonate groups.

14. (Amended) The process as claimed in claim 13, wherein the spacer arm is chosen from the groups:



in which n = 2 to 6, and -CONH-(CH₂)₆-, the attachment via the group -CONH taking place on the cryptate.

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15. (Twice Amended) The method as claimed in claim 1, wherein the rare-earth metal cryptate is a europium cryptate.

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16. (Amended) The process as claimed in claim 15, wherein the rare-earth metal cryptate is the europium cryptate Eu trisbipyridine or Eu [bisdiethoxybipyridine.bipyridine].

17. (Twice Amended) The process as claimed in claim 1, wherein the fluorescent conjugate is used as the only label or as one of the fluorescent labels in the assay.

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18. (Twice Amended) The process as claimed in claim 1, wherein the fluorescent conjugate is bonded covalently to one of the members of a pair of molecules capable of binding specifically to one another, in particular a cellular receptor, an antigen, an antibody or a nucleic acid.

19. (Twice Amended) The process as claimed in claim 1, wherein, in addition to said fluorescent conjugate, a fluorescent label comprising an acceptor fluorescent compound in the assay.